

Spectral Analysis
Shirley J. Burris
For Elements 2002

Students found the concept of identification of elements very difficult last year. The two-dimensional images we used were unwieldy, and students were not connecting the images with the idea.

More effective meaning might be gained in two ways:

- Auditory (thanks to Ilan for his help in evolving this)
- Kinesthetic

I. Auditory:
“Nickel-odeon”

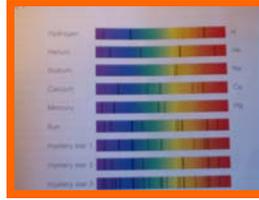
1. Print the visible light image saved in PDF. Zoom to tabloid size, and cut to strips for keys of keyboard.



2. Label one side of a keyboard “blue”, and the other side “red”.



3. Provide a solid form of the spectrum so that students can see the intact, uncut view.
4. Using black paper or tape strips, model two sample “prints” (one for H and one for He) (or nickel – to include the name of the activity). The ones in this photo were taken from information in the Science Power 9 text (McGraw-Hill-Ryerson), page 465. OR, colour toothpicks with black marker, and place on the spectrum model in the appropriate place.



5. Explain the models to the students.
6. “Play” the chord that results from the markings, and allow students to “hear” the element – the sound that results when H is “played” or He is “played”.
7. Encourage small groups of students to take turns creating their own “chords” for other elements, and design opportunities for discussion.
8. Explain that this is only a simulated model.
9. Transfer the experience to the concept.



II. Kinesthetic:
“Analyze This!”

1. Using paint, represent the visible light spectrum on mural paper.
2. OR - Using a colour printer, print the visible spectrum on an overhead, and project it on a white board.

3. Groups of students (perhaps volunteers could dress in black), position themselves along the spectrum to model various element “prints”.
4. Connect the model to the scientific concept.
5. As added interest, a digital camera could be used to get pictures of the students as they model the element prints, and pictures could be printed and posted on a wall that displays the elements.



Resources

http://imagine.gsfc.nasa.gov/docs/science/how_11/spectra.html

http://spaceresearch.nasa.gov/research_projects/light_06-2002.html

<http://imagers.gsfc.nasa.gov/ems/visible.html>

Visible Light Images from NASA site – targeted and saved.

<http://home.achilles.net/~jtalbot/data/elements/>

Spectra of Gas Discharges

<http://hea-www.harvard.edu/~efortin/thesis/html/Spectroscopy.shtml>

Spectroscopy

<http://can-do.com/uci/ssi2001/emspectrum.html>

WebQuest: Electromagnetic Spectrum

<http://www.can-do.com/uci/ssi2000/cosmicchemistry.html>

Cosmic Chemistry WebQuest